

Nalco Docket No. 7773
Customer No. 49459

REMARKS

Reconsideration in view of the following remarks and declarations submitted herewith is respectfully requested. Applicants have reviewed the Office Action and respectfully assert that this paper is responsive to all points raised therein. Claims 1 to 13, 15 to 18, and 20 to 23 are presently pending. Declarations under 37 C.F.R. § 1.132 of co-inventor Michael R. St. John and Program Manager Laura C. Copeland are submitted herewith. Dr. St. John's Declaration explains how the claimed polymers differ from those disclosed in the references of record and why the increased press dewatering effect at high glyoxalation is surprising and unexpected. Ms. Copeland's Declaration illustrates the outstanding commercial success of products that are commensurate with the instant claims.

In the Office Action, Claims 1 to 13, 15 to 18, and 20 to 23 were rejected under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as being unpatentable over Coscia as evidenced by U.S. Patent No. 6,083,348 to Auhorn et al. ("Auhorn") or U.S. Patent No. 6,315,866 B1 to Sanchez ("Sanchez"). These rejections are respectfully traversed.

REJECTIONS UNDER 35 U.S.C. § 102(b)

With respect to the rejection of Claims 1 to 13, 15 to 18, and 20 to 23 as being anticipated by Coscia, Applicants respectfully assert that Coscia does not disclose each and every element of the claimed invention. Coscia fails to disclose any method of enhancing the press section dewatering of a paper sheet on a paper machine. Instead, Coscia discloses a class of polymers useful for enhancing the temporary wet strength of tissue and towel grades of paper. (col. 2, lines 33 to 40). In no way does Coscia disclose the use of any polymers for enhancing the press section dewatering of a paper sheet on a paper machine. In particular, Coscia fails to disclose the claimed polymers and fails to disclose the use of such polymers for enhancing press section dewatering.

Moreover, as thoroughly discussed in Dr. St. John's Declaration under 37 C.F.R. § 1.132 filed herewith, Applicants' polymers are distinct from those disclosed in Coscia. Particularly, the polymer of the instant invention includes significantly higher amounts of unreacted glyoxal than

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those of Coscia. Coscia discloses that about "half of the glyoxal (as determined by dialysis) does not react at all but remains dissolved in the water." (col. 6, lines 41 to 43). In contrast, the claimed polymers have significantly greater than 50 mol% unreacted glyoxal. With regard to the amount of di-reacted glyoxal as compared to mono-reacted glyoxal, Coscia states, "The remainder of the glyoxal (a very small amount) reacts to the extent of both its functionalities." (col. 6, lines 45 to 48). With reference to Dr. St. John's Declaration, the polymers of the instant claims have significantly higher amounts of di-reacted amino or amido groups, including a minimum level of di-reacted amino or amido groups. Specifically, the data indicates that about 9 mol% (of the total 20 mol% or more) of the reacted glyoxal is di-reacted.

Applicants respectfully point out that to anticipate, either explicitly or inherently, every claim element and limitation must be set forth in a single prior art reference, in the same form and order as in the claim. (See *In re Omeprazole Patent Litigation*, 483 F.3d 1367, 1373 (Fed. Cir. 2007); *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1267 (Fed. Cir. 1991)). Furthermore, the reference must also enable that which it is asserted to anticipate. (*Omeprazole*, 483 F.3d at 1378 ("To 'anticipate,' the identical subject matter must not only be previously known, but the knowledge must be sufficiently enabling to place the information in the possession of the public."); *Elan Pharmaceuticals, Inc. v. Mayo Found. for Medical Educ. & Research*, 346 F.3d 1051, 1054 (Fed. Cir. 2003)).

Applicants respectfully submit that Coscia fails to disclose every element of the claimed invention and is not sufficiently enabling for the use of any polymer as a press section dewatering enhancer in the manner claimed. The polymers of the instant claims are patentably distinct over those disclosed in Coscia. In addition, Coscia is not sufficiently enabling for one having skill in the art to use any polymers whatsoever to enhance the press section dewatering of a paper sheet on a paper machine. Therefore, Applicants respectfully assert that Coscia fails to anticipate Claims 1 to 13, 15 to 18, and 20 to 23 and respectfully request withdrawal of this rejection.

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REJECTIONS UNDER 35 U.S.C. § 103(a)

With respect to the alternative rejection that Claims 1 to 13, 15 to 18, and 20 to 23 are obvious under 35 U.S.C. § 103(a), the Examiner relies on Coscia for its teachings of using aldehyde-functionalized polymers for the purpose of increasing temporary wet strength. Applicants respectfully traverse this rejection.

Coscia, either alone or as evidenced by Auhorn or Sanchez, fails to teach or suggest the invention as claimed. Coscia in no way teaches or suggests utilizing the aldehyde-functionalized polymers of the present invention for enhancing press dewatering. To the contrary, Coscia expressly teaches away from using its polymers with a reacted ratio of greater than 0.12. Though Coscia states that ratios ranging from 0.06 to 0.20 afford the best wet strength efficiency, its teachings would not in any way motivate one skilled in the art to use polymers having greater than a 0.12 ratio, and, at the very least, would completely discourage attempting using polymers a ratio greater than 0.20.

The Examiner further notes, "Absent convincing evidence of unexpected results commensurate with the scope of the claimed subject matter, obtaining reacted glyoxal to vinylamide ratios within the claimed range would have been obvious to one of ordinary skill in the art." (Office Action at page 5). In addition to the fact that Coscia teaches away from the claimed invention and the patentably distinct structural characteristics of the instant polymers (as explained above and in detail in Dr. St. John's Declaration), Applicants submit herewith evidence of secondary considerations sufficient to overcome these rejections.

As stated in the MPEP, "Objective evidence, sometimes referred to as "secondary considerations," may include evidence of commercial success, long-felt but unsolved needs, failure of others, and unexpected results. The evidence may be included in the specification as filed, accompany the application on filing, or be provided in a timely manner at some other point during the prosecution." Secondary considerations "are the controlling inquiries in any obviousness analysis." (MPEP § 2141). Applicants respectfully submit that the experimental evidence of surprising and unexpected results in Dr. St. John's Declaration is sufficient to overcome this rejection.

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Applicants respectfully direct the Examiner's attention to the Declaration submitted herewith by Dr. St. John. Figure 1 therein shows comparative conventional dewatering data from a vacuum filtration apparatus (a standard laboratory apparatus known in the art for testing dewatering efficiency) for the glyoxalated polymers of the instant application, compared to conventional polymers used as drainage aids. Glyoxalated polymers at two glyoxal levels provided no increase in drainage rate, while the conventional cationic polyacrylamide used as a drainage aid showed a dramatic increase in drainage rate. Within experimental error, the glyoxalated polymers show at best little activity even at high doses. Based on results from such standard dewatering tests, one skilled in the art would conclude that aldehyde-functionalized polymers would be of no use whatsoever for improving press section dewatering in paper applications.

Moreover, direct temporary wet strength testing of the polymers described in Coscia shows, in agreement with Coscia's disclosure, a decreased ability to impart temporary wet strength beyond a reacted ratio of 0.12. (see Figure 2, Dr. St. John's Declaration). In contrast, the polymers of the present invention display increased press section dewatering well beyond the Coscia maximum of 0.12 to at least 0.26. Thus, based on the temporary wet strength imparted by the Coscia polymers, no increase in press section dewatering activity would be predicted when the ratio of added glyoxal increases from 0.4 to 0.8, which is contrary to the press dewatering results observed. Based on information provided in Coscia, the dramatic increase in press dewatering upon increasing the level of glyoxalation would not be expected whatsoever.

To bolster the secondary consideration analysis, Applicants submit evidence of outstanding commercial success. To afford such commercial success weight, Applicants must offer proof "that the sales were a direct result of the unique characteristics of the claimed invention" and that such sales were not a by-product of other economic and commercial factors unrelated to the particular characteristics or quality of the claimed subject matter." (see *In re Huang*, 100 F.3d 135, 140 (Fed. Cir. 1996); see also *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995) ("For objective evidence to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention.")).

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Supporting a contention of nonobviousness when asserting evidence of commercial success requires that Applicants bear "the burden of proof of establishing a nexus between the claimed invention and evidence of commercial success." (MPEP § 716.03). The Federal Circuit has clearly articulated how such a nexus is to be articulated: A prima facie case of nexus is made when Applicant shows (i) commercial success and (ii) that the thing (product or method) that is commercially successful is disclosed and claimed. (see *Demaco Corp. v. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988)).

Applicants respectfully direct the Examiner's attention to Ms. Copeland's Declaration. As to the first prong of the nexus test, Ms. Copeland's Declaration shows that during its first 21 months on the commercial market, the products in question had over \$30 million dollars in revenue. Marketing efforts for this technology were similar in scope to other technology offerings. That is, the astounding commercial success was not the result of extraordinary marketing efforts. Applicants were able to gain and retain the described sales due to the unique press dewatering characteristics of the instantly claimed method and not due to targeted or extraordinary marketing efforts. The products were extremely well received by the paper industry, have satisfied an unmet need for enhanced press section dewatering, and have achieved exceptional commercial success on their own merits. The unique press section dewatering properties of this technology has allowed Applicants to take and keep business from competition in Board & Packaging Grades. Moreover, Applicants have been able to expand the products into new markets for press dewatering, namely Graphics Grades, with this technology.

To avoid redundancy, Ms. Copeland's Declaration does not present chemical analyses of the products in question. Applicants respectfully direct the Examiner's attention to Dr. St. John's Declaration for such technical data. In paragraph 5, Dr. St. John states that his analyses are of the same products as the commercial success data presented in Ms. Copeland's Declaration, thus satisfying the second prong of the nexus test.

As should be appreciated based on the foregoing, the instant claims are novel and nonobvious over the references of record. To establish a prima facie case of obviousness, the Examiner bears the initial burden of showing that that prior art has some suggestion or motivation and that there is a reasonable expectation of success to select the elements of the

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instant claims. Moreover, for an invention to be obvious, the cited prior art must provide a reason for selecting the procedure used by the Applicant. (See *In re Dow Chemical*, 5 U.S.P.Q.2d 1529, 1532 (Fed. Cir. 1988) and *Interconnect Planning Corporation v. Feil*, 227 U.S.P.Q. 543, 551 (Fed. Cir. 1985)). "Both the suggestion and the expectation of success must be founded in the prior art, not in the Applicant's disclosure." (*In re Dow Chemical*, 5 U.S.P.Q.2d at 1531). "Rather, particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components in the manner claimed." (*In re Kotzab*, 55 U.S.P.Q.2d 1313, 1316 (Fed. Cir. 2000)).

There is simply no teaching or suggestion in *Coscia* to motivate one skilled in the art to select the elements as claimed in the instant invention. The claimed invention goes against the teachings of the references of record and has achieved outstanding commercial success on its own merits. Applicants thus respectfully submit that Claims 1 to 13, 15 to 18, and 20 to 23 are nonobvious and patentably distinct over *Coscia* and respectfully request that the outstanding rejections be withdrawn.

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CONCLUSION

In view of the foregoing remarks, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. §§ 102(b), and 103(a). Applicants respectfully assert that all pending claims in this Application are in condition for allowance. Should the Examiner have any questions or comments as to form, content, or entry of this paper, or if any further issues yet to be resolved to advance prosecution of this Application to issue, the Examiner is invited to telephone the undersigned counsel.

Entry of this paper and allowance of all pending Claims 1 to 13, 15 to 18, and 20 to 23 is respectfully requested. Applicants earnestly solicit early notice to this effect.

Respectfully Submitted,


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